

PD-0321

Risk factors for local-regional recurrences after mastectomy and adjuvant radiotherapy for breast cancer.

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Purpose/Objective: To determine risk factors for local-regional recurrences (LRR) after mastectomy and adjuvant radiotherapy for breast cancer (BC) patients

Materials and Methods: From January 2000 till December 2005, 749 BC patients were treated in a single institution with mastectomy, axillary dissection and postmastectomy radiotherapy (PMRT). Neo-adjuvant and/or adjuvant chemotherapy was given in 57.8% of the patients and 77.2% also received endocrine therapy. Indications for PMRT are pN+, pT3, pT4 and positive surgical margins. 15.4% (115) of the patients received radiotherapy of the chest wall alone and 67.6% (506) of the patients underwent irradiation of the chest wall with regional nodal irradiation (RNI). RNI involved radiotherapy to the internal mammary and medial supraclavicular nodes (IM-MS) in 67.4% and to the IM-MS and axilla in 32.6%. In 17.1% (128) of the patients with a pT1-2 tumour, only the IM-MS are irradiated (without chest wall irradiation) because of a medially or centrally located tumour. All clinical and pathological data were reviewed retrospectively. The association between categorical variables and the risk to relapse is tested by means of the log-rank test (univariate analysis).

Results: At a median follow-up of 9 years, 26 of 749 patients (3.5%) developed LRR. Five- and 10-years local-regional control rates were 97.6% and 96.0%. Predictive factors to develop LRR are grade 3 tumours (p=0.009), pT4 (p<0.001), pN3 (p=0.03), estrogen receptor (ER) negative BC (p<0.001), progesterone receptor (PR) negative BC (p=0.006), Her-2 receptor positive BC (p=0.03) and triple negative BC (p=0.02). There was no association between LRR and tumour type (p=0.3), extensive intraductal component (p=0.7) and positive surgical margins (p=0.06). We also found no correlation between age and LRR (p=0.2) (Cox proportional hazards model). By the time of the congress we will be able to present the multivariate analysis as well.

Conclusions: In breast cancer patients treated with mastectomy and adjuvant radiotherapy with or without systemic treatment the LRR at our institution are very low at 10 years. Notwithstanding few LRR, grade 3 tumours, pT4, pN3, ER negative, PR negative, Her-2 positive and triple negative BC are clear risk factors to develop LRR.

PD-0322

The Cambridge post-mastectomy radiotherapy (C-PMRT) index: a practical tool for patient selection

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Purpose/Objective: Post mastectomy radiotherapy (PMRT) reduces loco-regional recurrence (LRR) and has been associated with survival benefit. International consensus recommends PMRT for patients with tumour size ≥5cm (T3), tumour invasion of the skin, pectoral muscle or chest wall (T4) and patients with ≥ 4 positive lymph nodes (LN). The role of PMRT for patients with 1-3 positive LN and LN negative patients is contentious. Apart from LN status, other prognostic factors for LRR include tumour grade, tumour size and lymphovascular invasion (LVI). It is unclear how these prognostic factors should be used to select patients for PMRT. In 1999, an index was designed based on these prognostic factors at the Cambridge Breast Unit (CBU) for patient selection. This study reports a 10 year experience using the C-PMRT index.

Materials and Methods: The C-PMRT index was constructed with scores (1-3) allocated in each of four categories including the number of positive LN/LVI, tumour size, margin status and tumour grade (Table 1). Patients with tumour T3/T4 tumour or with ≥ 4 positive LN were categorised as high (H) risk. Other patients with an aggregate score of ≥ 3 on C-PMRT were categorised as Intermediate (I) risk and <3 as low (L) risk. PMRT was recommended for H and I risk patients. The LRR, distant metastasis and overall survival (OS) data was collected from patient's records. The length of follow up or time to an event was measured from the day of mastectomy.

Table 1: Cambridge Post-Mastectomy Radiotherapy (C-PMRT) Index

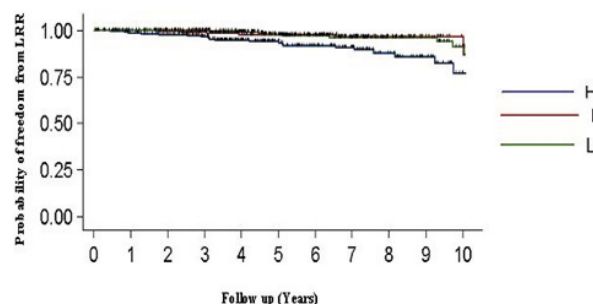
Score	3	2	1
Number of positive lymph nodes or LVI	≥ 4	1-3	LVI
Invasive tumour size	>50mm (T3) or T4	30-50mm	20-29 mm
Excision margins	Deep margin < 1mm or pectoral muscle invasion		
Tumour grade			Grade 3

LVI: Lymphovascular invasion.

T4: Tumour of any size with direct extension to the chest wall and/or to the skin (ulceration or skin nodules)

Results: From 1999-2009, 898 invasive breast cancers in 883 patients were treated by mastectomy at the CBU (H: 323, I: 231 and L: 344). All patients underwent axillary sampling ± axillary clearance. Median age was 60 years (range 23-96) and at a median follow up of 5.2 years, 4.7% (42/898) developed LRR. The 5 yr actuarial LRR rates were 6%, 2% and 3% for the H, I and L risk groups respectively (Figure 1). Only 1.2% (11/898) developed isolated LRR (I risk group, n=0; H risk, n=3; L risk, n=8). The 5 yr actuarial OS survival rates were 67%, 77% and 90% for H, I and L risk groups respectively.

Figure 1: Probability of freedom from loco-regional recurrence (LRR) between the High (H), Intermediate (I) and Low (L) risk group.



Conclusions: Based on published literature, one would have expected a higher LRR rate in the I risk group without adjuvant RT. We hypothesise that the I risk group LRR rates have been reduced to that of the L risk group by the addition of RT. Apart from LN status, other prognostic factors should also be considered in selecting patients for PMRT (similar to selecting patients for systemic chemotherapy-adjuvant online). This pragmatic tool requires further validation from randomised trial data.

PROFFERED PAPERS: CLINICAL 4: IMAGING

OC-0323

Diffusion weighted MRI to monitor response to radiation therapy modelled by tissue permeabilization

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Purpose/Objective: Ionizing radiation exposure can induce immediate cell membrane permeabilization, which inflicts loss of cell ionic equilibrium, depletion of adenosine triphosphate (ATP) and formation of reactive oxidative species (ROS). This manifests through morphological changes, including cellular swelling, shrinkage, blebbing, lysis and extracellular edema, depending on severity of permeabilization. In this study we mimic radiation induced brain tissue permeabilization, through the application of local static electric fields (electroporation) *in vivo*. The purpose of the study is to evaluate diffusion weighted MRI (DW-MRI) as a non-invasive technique